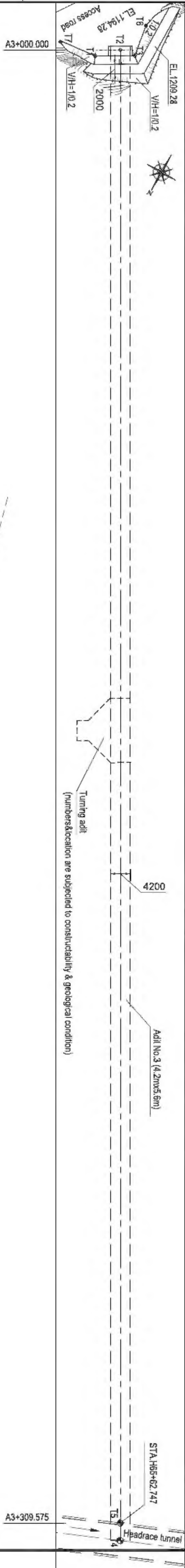


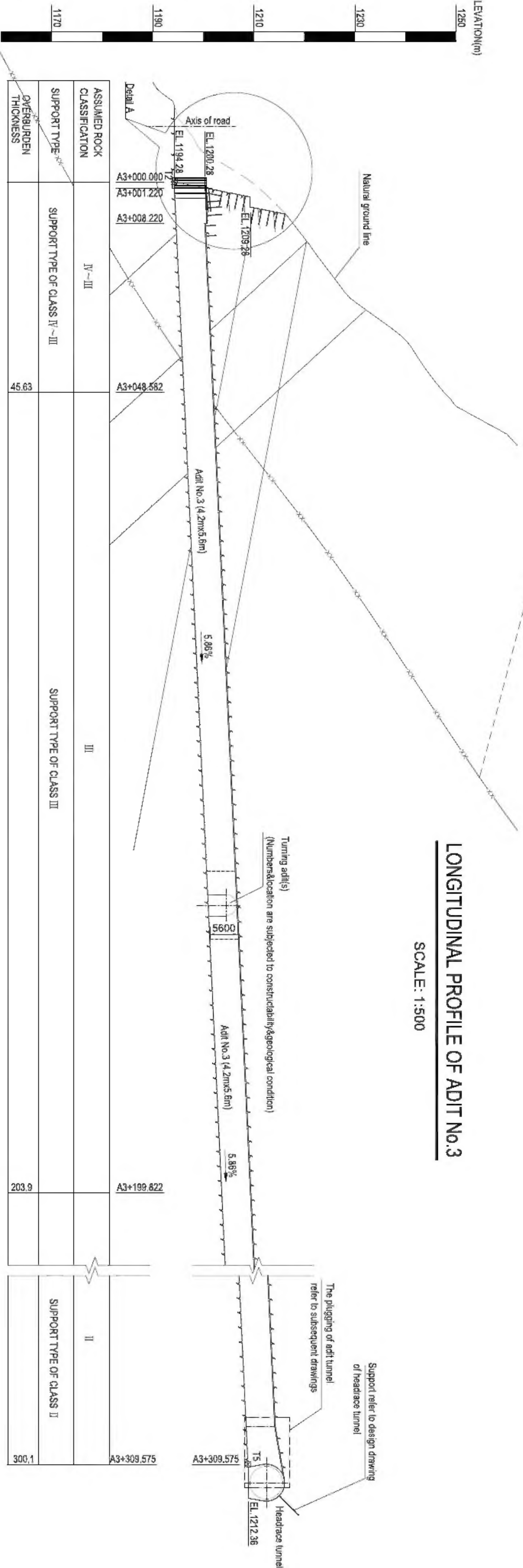
### GENERAL PLAN LAYOUT OF ADIT NO.3

SCALE: 1:500



### LONGITUDINAL PROFILE OF ADIT NO.3

SCALE: 1:500



### Legend

- Gravels
- Interbedded Mica Schist and Quartz-Schist
- Inferred boundary between moderately weathered and slight weathered
- Inferred lithology boundary
- Joint number and attitude (Dip direction/Dip)

### JOINT SETS OF ADIT NO.3

ID	Occurrence
1	J15 280° 46°
2	J16 40° 28°
3	Foliation 29° ~34° 15° ~30°

### Control points

No.	Coordinates(m)	EL.(m)
T1	3108930.680 622312.158	1194.28
T2	3108927.083 622308.124	1194.28
T3	3108926.709 622304.867	1194.28
T4	3109203.146 622160.036	1213.36
T5	3109199.899 622161.779	1213.36
T6	3108920.061 622305.778	1194.28
T7	3108931.518 622319.961	1194.28

### NOTE

1. This set of drawings are excavation and initial support of No.3 adit.
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
3. The designer shall provide alternatives and options in the tunnel support design, so that the support can be adjusted in case geological conditions are varying.
4. The end position of the adit No.3 may be adjusted according to the final design of the headrace tunnel.
5. These rock classes and length estimates in drawings are purely speculative, and all rock classes may be encountered.

Scale:



### REFERENCE DRAWINGS

UT-C-150-CV-C-43004	Summary: Soil Stability Evaluation of Adit No.3
UT-C-150-CV-C-43004	Initial Design Review of Excavation and Support for Underground Construction
UT-C-150-CV-C-43004	Design of Excavation and Support for Adit No.3
UT-C-150-CV-C-43004	Design of Excavation and Support for Adit No.3

### SYMBOL AND LEGEND

### FOR APPROVAL

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D	10.OCT.2021	FOR APPROVAL	DONG Z.Z.	LI Y.G.	HEO J.B.
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Upper Trishuli-1 HEP (216MW)

OWNER



OWNER'S ENGINEER



CONTRACTOR

**DOOSAN Heavy Industries & Construction**

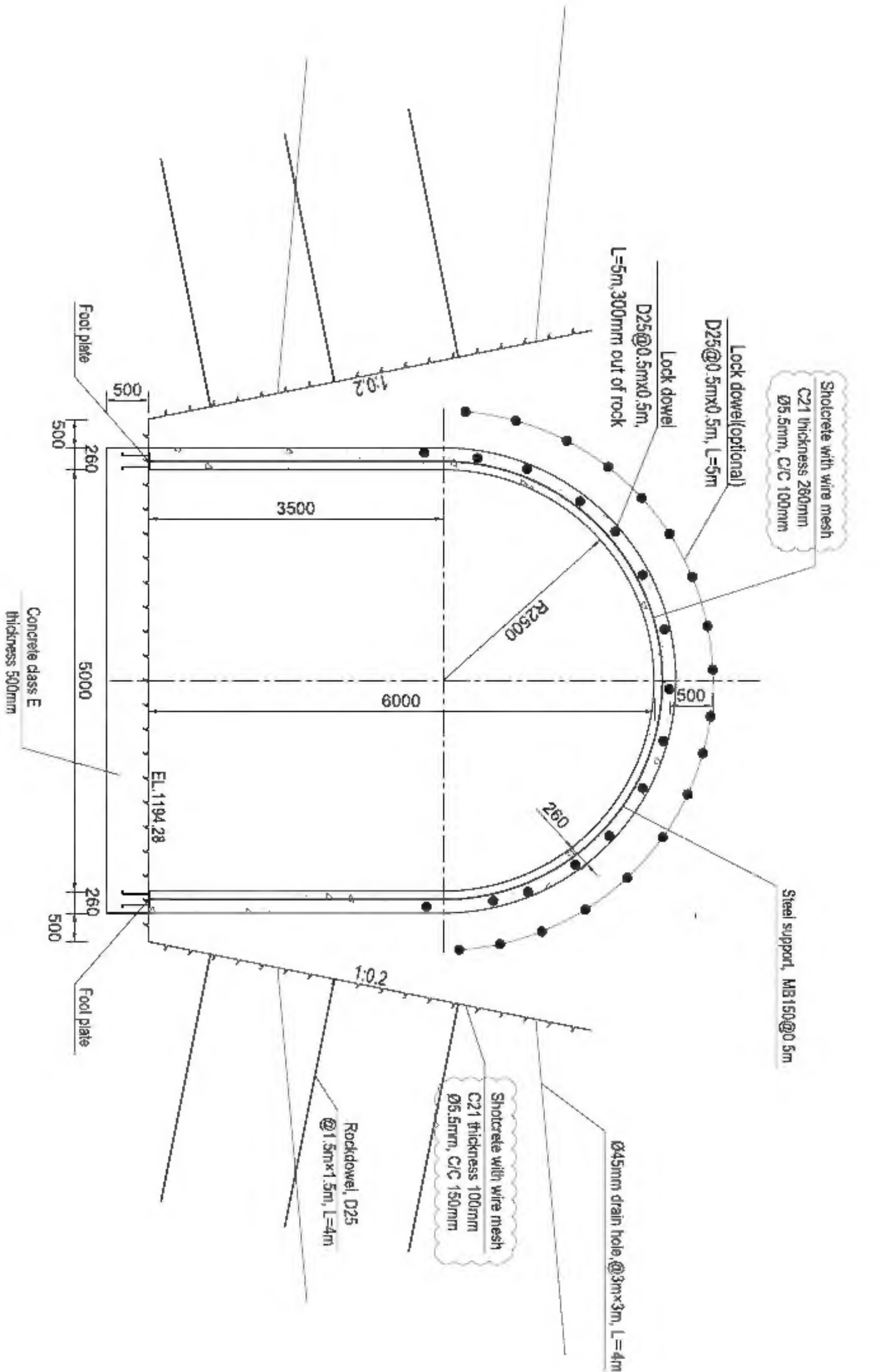
DRAWING TITLE  
EXCAVATION AND INITIAL SUPPORT DRAWINGS  
OF ADIT NO.3 (1/5)

NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-150-CV1-DG-43004	1 OF 5	F

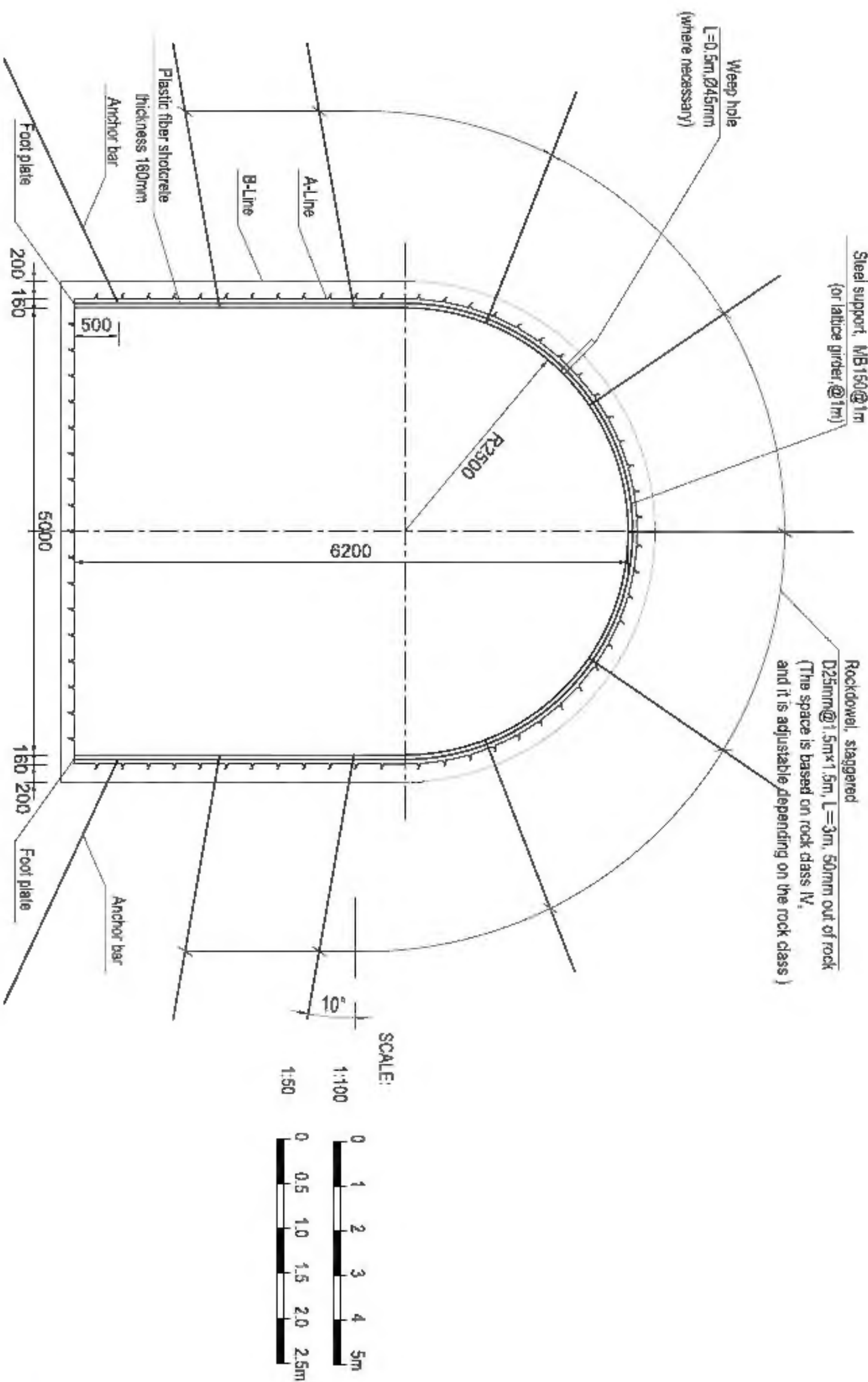


1. This set of drawings are the excavation and initial support of adit No.3.
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
3. The thickness of concrete cover is 50mm.
4. Symbol description:
  - A-Line is the design excavation line.
  - B-Line is the overbreak line.
  - R-denotes round bar, yield strength of the round bar is 280MPa.
  - D-denotes deformed bar, yield strength of the deformed bar is 500 MPa.
5. Strength specification of concrete & shotcrete:
  - (1) Concrete class E: Cylinder specified compressive strength 24MPa at 28 days.
  - (2) Concrete class C: Cylinder specified compressive strength 12MPa at 28 days.
  - (3) Shotcrete: Cylinder specified compressive strength 25MPa at 28 days except specified.
6. Other notes see sheet 1.

SCHEMATIC DIAGRAM OF OPEN TUNNEL  
(SECTION A-A)  
SCALE 1:50



SUPPORT TYPE OF TUNNEL ENTRANCE SECTION  
(A3+001.220-A3+008.220)  
SCALE 1:50



FOR APPROVAL

REFERENCE DRAWINGS	
UT-C-150-CV-04-C-40002	Sampling Rock Stability Evaluation of Adit No.3
UT-C-100-CV-04-00-000-01-05	Initial Design Drawing of Excavation and Support for Underground Access
UT-C-045-CV-04-00-0005	Layout Drawing of Reinforcing for Adit No.3
UT-C-150-CV-04-C-40001	Drawing of excavation and NO.3 piling

SYMBOL AND LEGEND

REV. NO.	DATE	DESCRIPTION	DRAWING	CHNO.	APPRO.
F	31.JAN.2022	FOR APPROVAL	DONE Z.Z.	Li Y.G.	Hei J.B.
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D	10.JEC. 2021	FOR APPROVAL	DONE Z.Z.	Li Y.G.	Hei J.B.
C	10.SEP. 2021	FOR APPROVAL	DONE Z.Z.	Li Y.G.	Hei J.B.
B	25.JUL. 2021	FOR APPROVAL	DONE Z.Z.	Li Y.G.	Hei J.B.
A	25.MAY. 2021	FOR APPROVAL	DONE Z.Z.	Li Y.G.	Hei J.B.

Upper Trishuli-1 HEP (216MW)



OWNER'S ENGINEER



CONTRACTOR

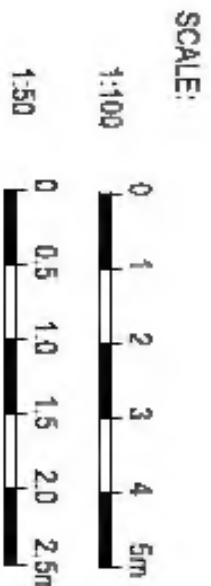
**DOOSAN Heavy Industries & Construction**

DRAWING TITLE  
EXCAVATION AND INITIAL SUPPORT DRAWINGS  
OF ADIT NO.3 (2/5)

NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-150-CV1-DG-43004	2 OF 5	F



1. This set of drawings are the excavation and initial support of adit No.3.  
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.  
3. Other notes see sheet 1.



REFERENCE DRAWINGS

UT1-C-150-CV-40-43004	Summary Rock Stability Calculations of Adit No.3
UT1-C-100-CV-40-4300-00-048	Detailed Design Drawing of Excavation and Support for Subterranean Access
UT1-C-046-CV-40-4300-0005	Layout Drawing of Reinforcing for Adit No.3
UT1-C-150-CV-40-43001	Drawing of excavation and NO.3 plotting

SYMBOL AND LEGEND

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D	10.DEC. 2021	FOR APPROVAL	DONE Z.Z.	Li Y.G.	Heo J.B.
C	10.OCT. 2021	FOR APPROVAL	DONE Z.Z.	Li Y.G.	Heo J.B.
B	25.JULY. 2021	FOR APPROVAL	DONE Z.Z.	Li Y.G.	Heo J.B.
A	25.MAY. 2021	FOR APPROVAL	DONE Z.Z.	Li Y.G.	Heo J.B.

PROJECT TITLE

Upper Trishuli-1 HEP (216MW)

OWNER



OWNER'S ENGINEER



CONTRACTOR

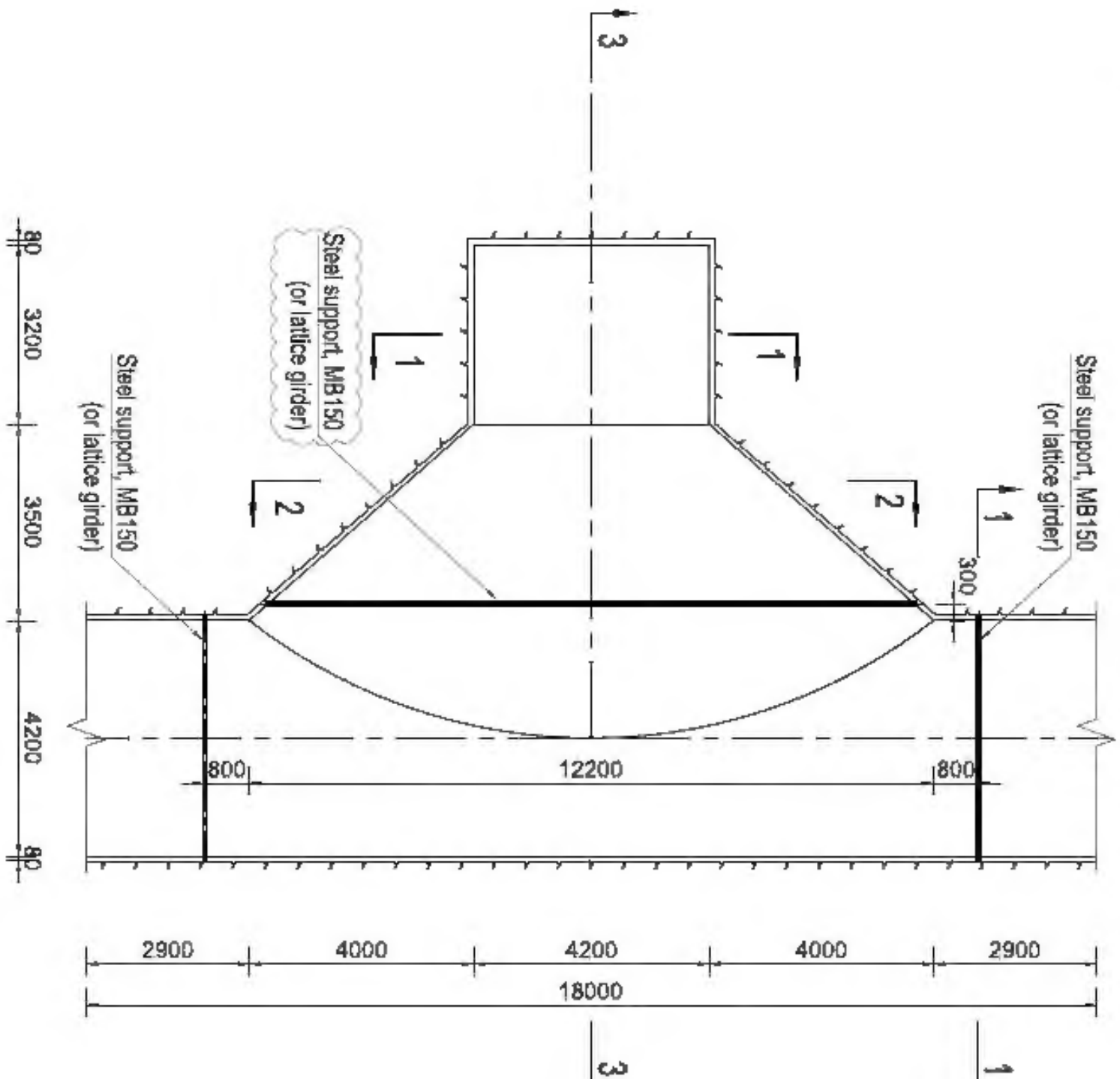
**DOOSAN Heavy Industries & Construction**

DRAWING TITLE

EXCAVATION AND INITIAL SUPPORT DRAWINGS  
OF ADIT NO.3 (3/5)

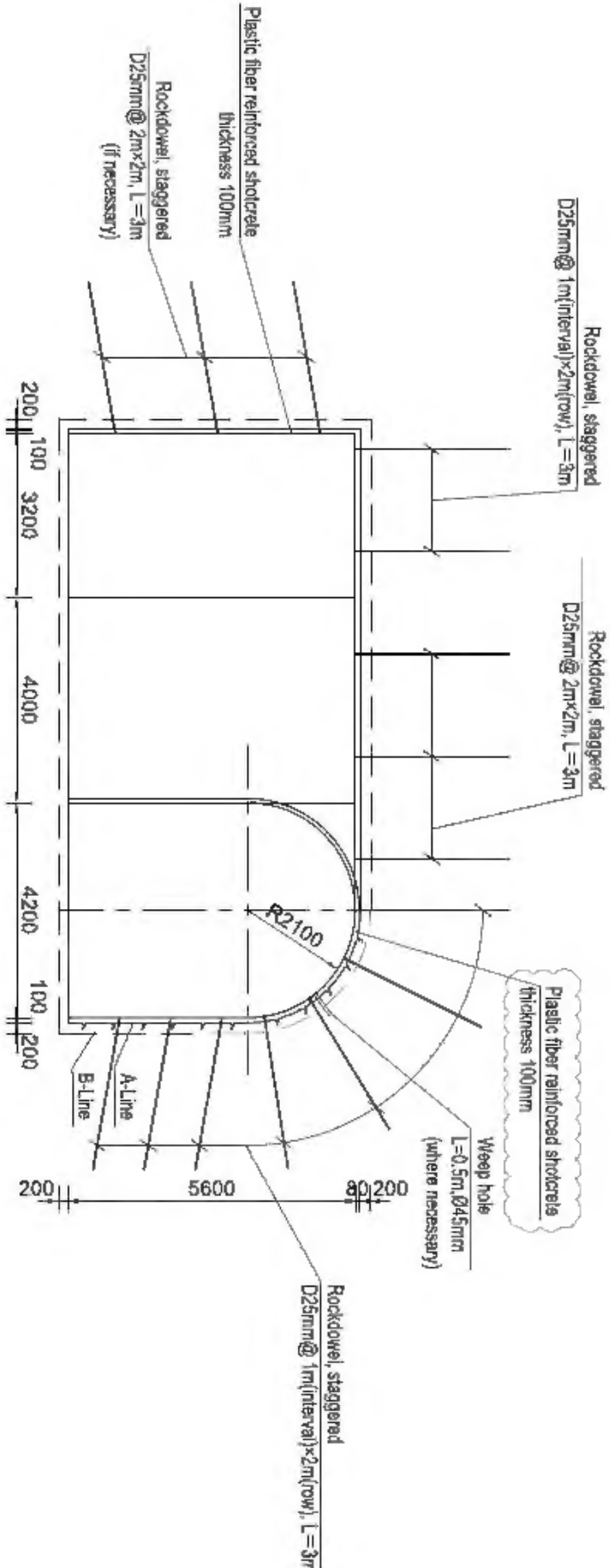
NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-150-CV-L-DG-43004	3 OF 5	F

PLAN OF TURNING ADIT (ROCK CLASS III)  
SCALE 1:100



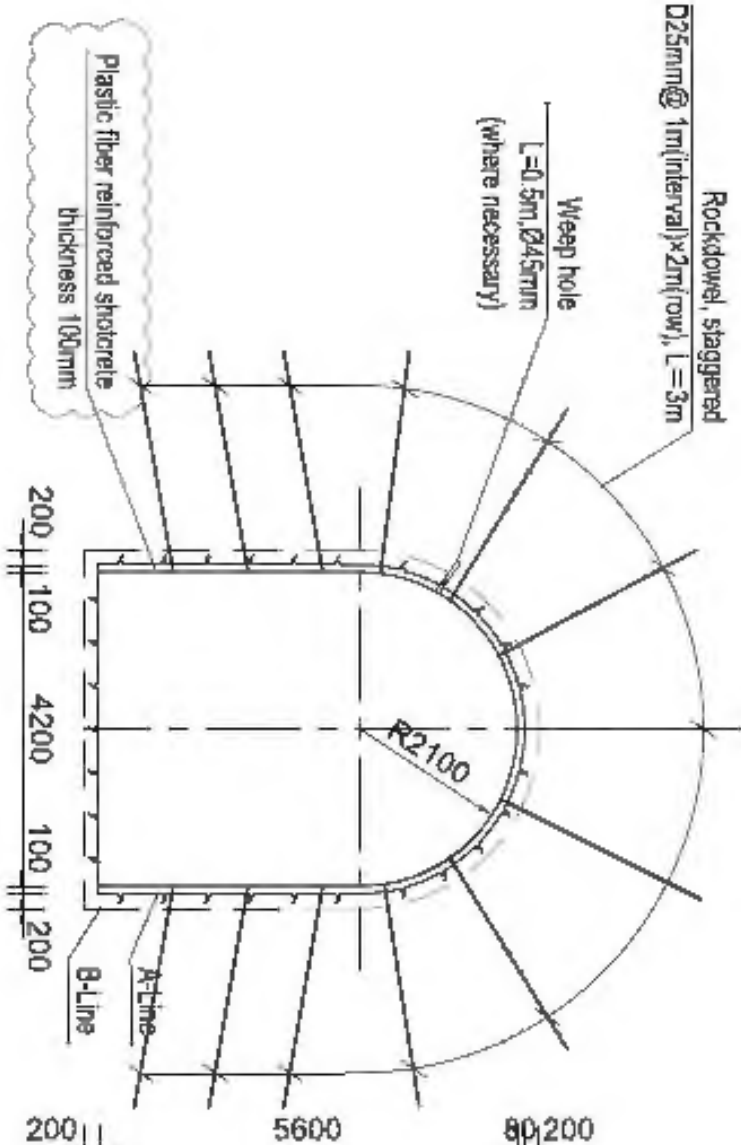
SECTION 3-3

SCALE 1:100



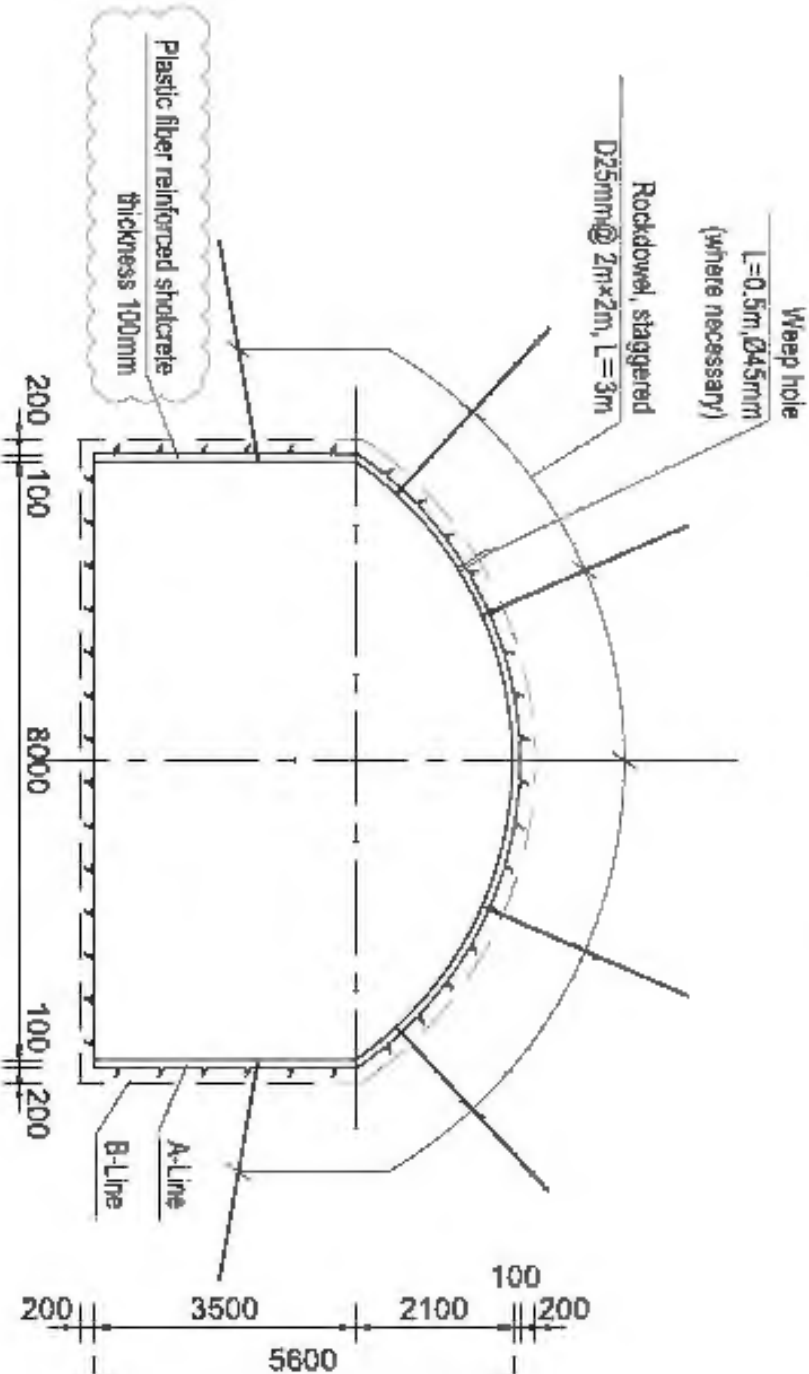
SECTION 1-1

SCALE 1:100



SECTION 2-2

SCALE 1:100



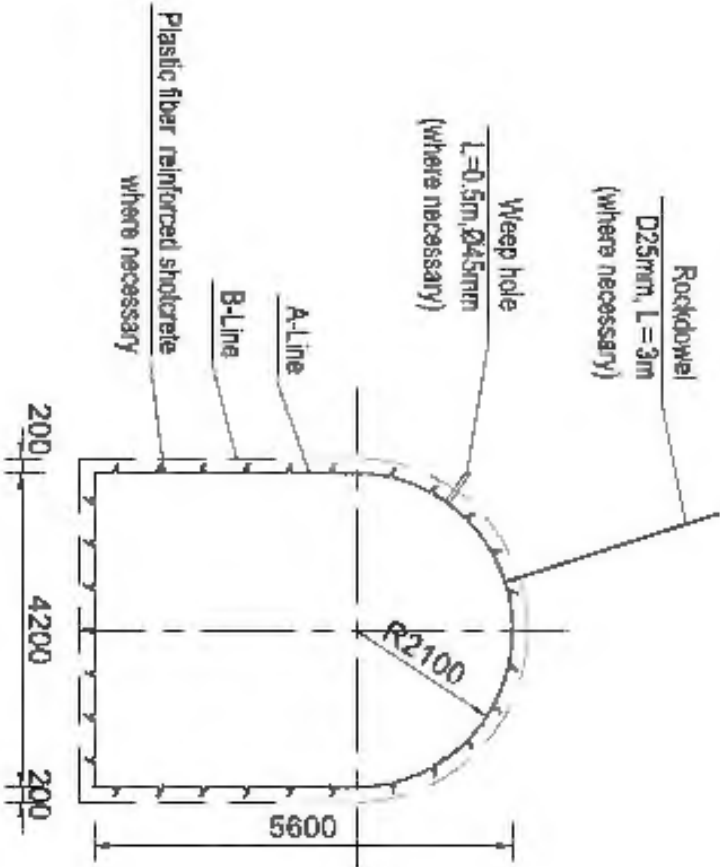
TUNNEL SUPPORT PATTERN

	Class I	Class II	Class III	Class IV	Class V
Support pattern	Q>40	10<Q<40	4<Q<10	1<Q<4	Q<1
Rock mass quality	Spot boring D25, L=3m	Pattern boring D25@2.5L=5m (in tunnel roof)	Pattern boring D25@2.0m, L=3m (alternative)	Pattern boring D25@1.5m, L=3m (alternative)	Pattern boring D25@1.0m, L=3m (alternative)
Rock dowel	---	T=50mm(PFRS)	T=100mm(PFRS)	T=100mm(PFRS)	T=160mm(PFRS)
Shotcrete	---	---	---	MB150@1.0m or (lattice girder @1m) (where necessary)	MB150@1.0m or (lattice girder @1m) (where necessary)
Steel support	---	---	---	---	---
Supplementary support	---	---	---	---	---
Unsupported span for shotcrete(m)	---	9	2	1.5	0.5-1.0
Unsupported span for rock dowel(m)	---	6	4	3	0.5-1.0
Unsupported span for steel support(m)	---	---	---	0.5-1.0	0.5-1.0
Excavation span(m)	3	3	2	10-15	0.5-1.0
Excavation method	Blasting/Photoacoustically				Mechanically



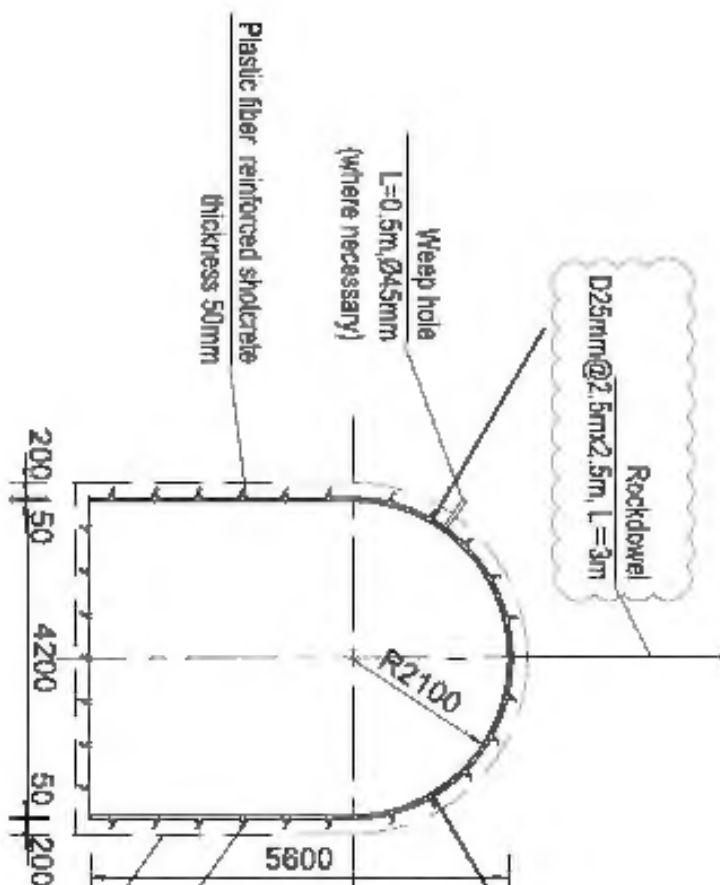
SUPPORT TYPE OF ROCK CLASS I

SCALE 1:100



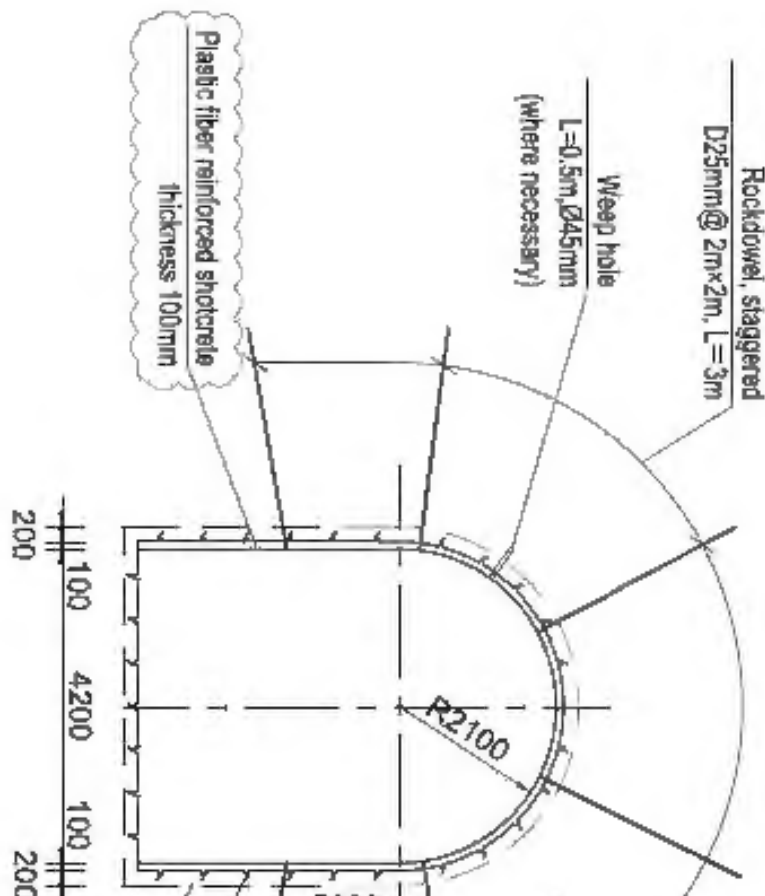
SUPPORT TYPE OF ROCK CLASS II

SCALE 1:100



SUPPORT TYPE OF ROCK CLASS III

SCALE 1:100



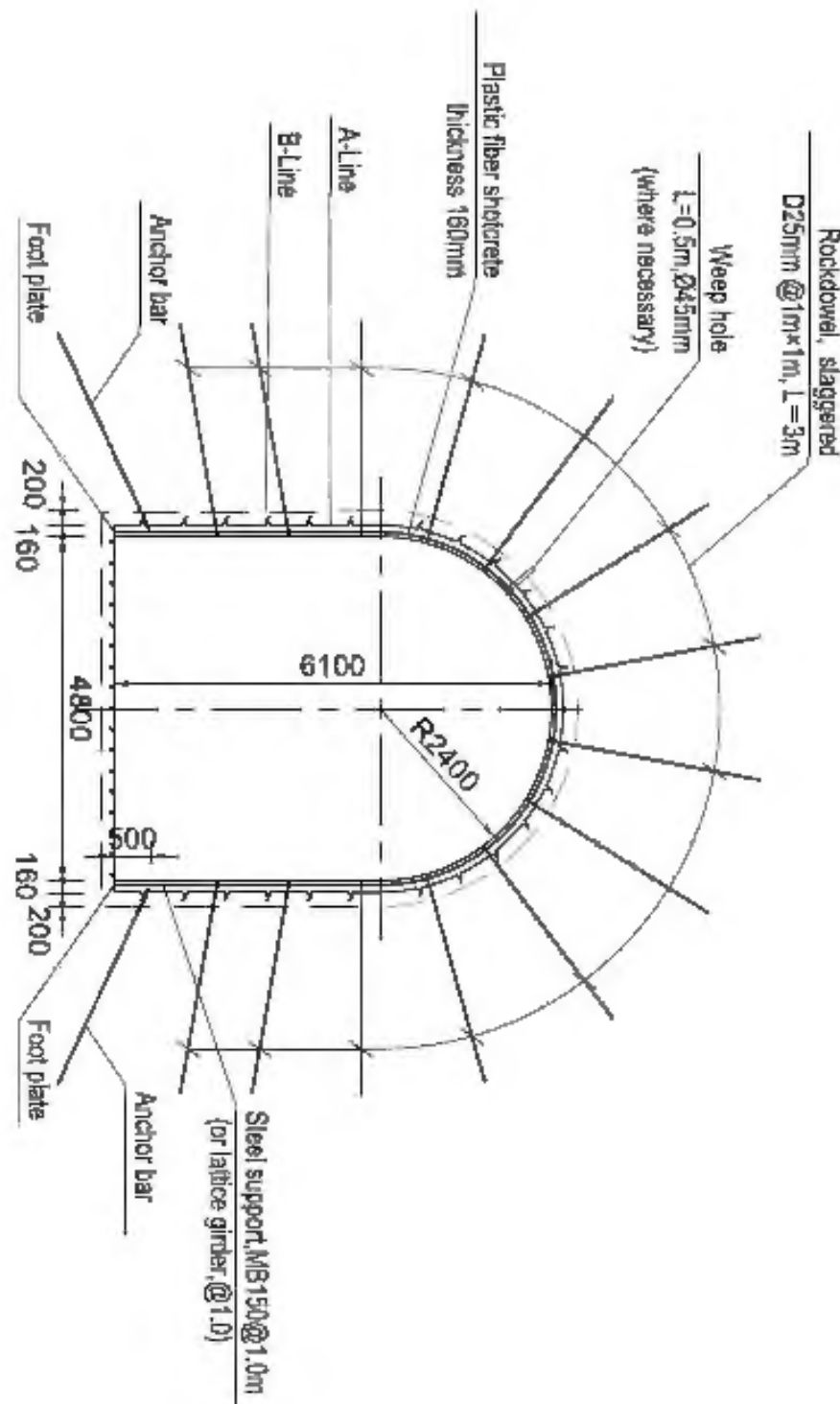
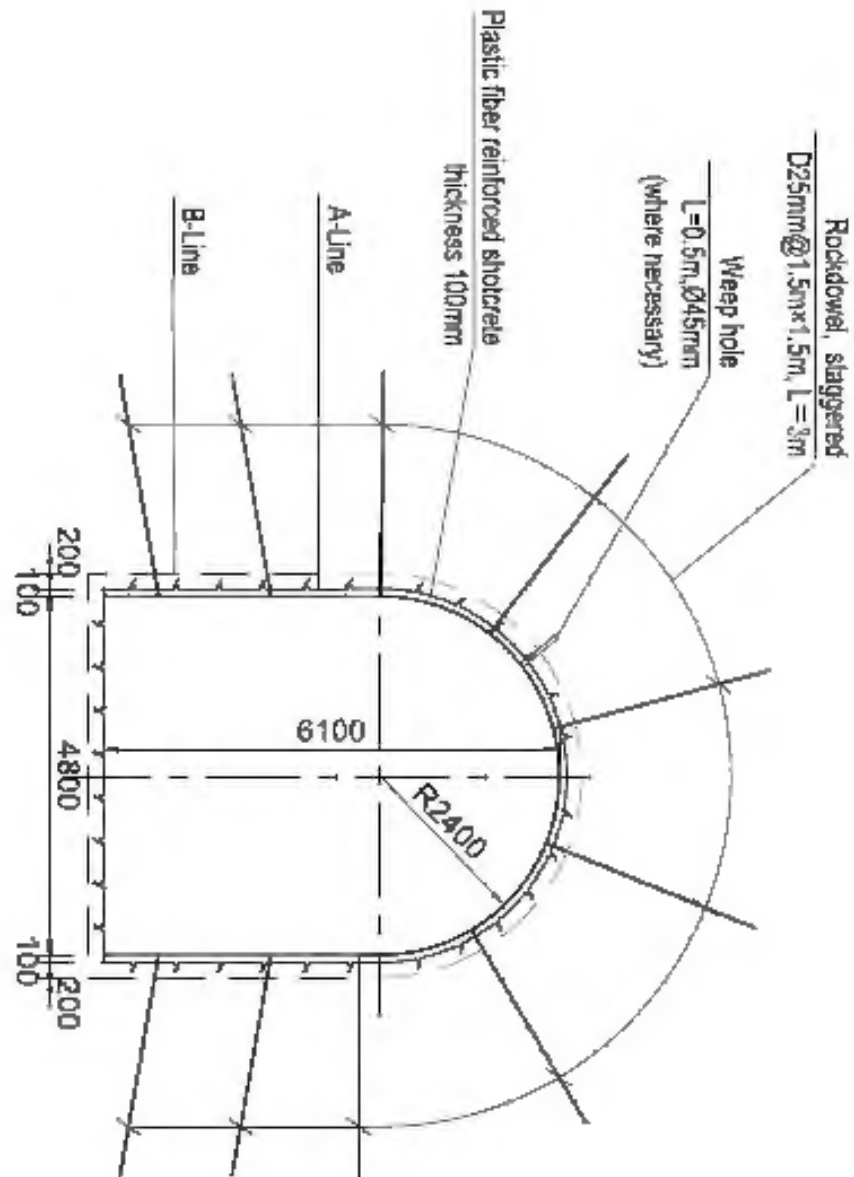
SUPPORT TYPE OF ROCK CLASS IV

SCALE 1:100

Buried Depth (m)	<=100	150	200
Plastic Fiber Shotcrete Thickness(mm)	100	120	160
Rock dowel	Pattern boring D25@1.5L=3m Staggered	Pattern boring D25@1.0L=3m Staggered	Pattern boring D25@1.0L=3m Staggered
Shotcrete Strength(MPa)	25	30	30
Steel support	--	--	MB150@1.0m or lattice girder@1m

ACROSS SECTION OF FOREPOLING

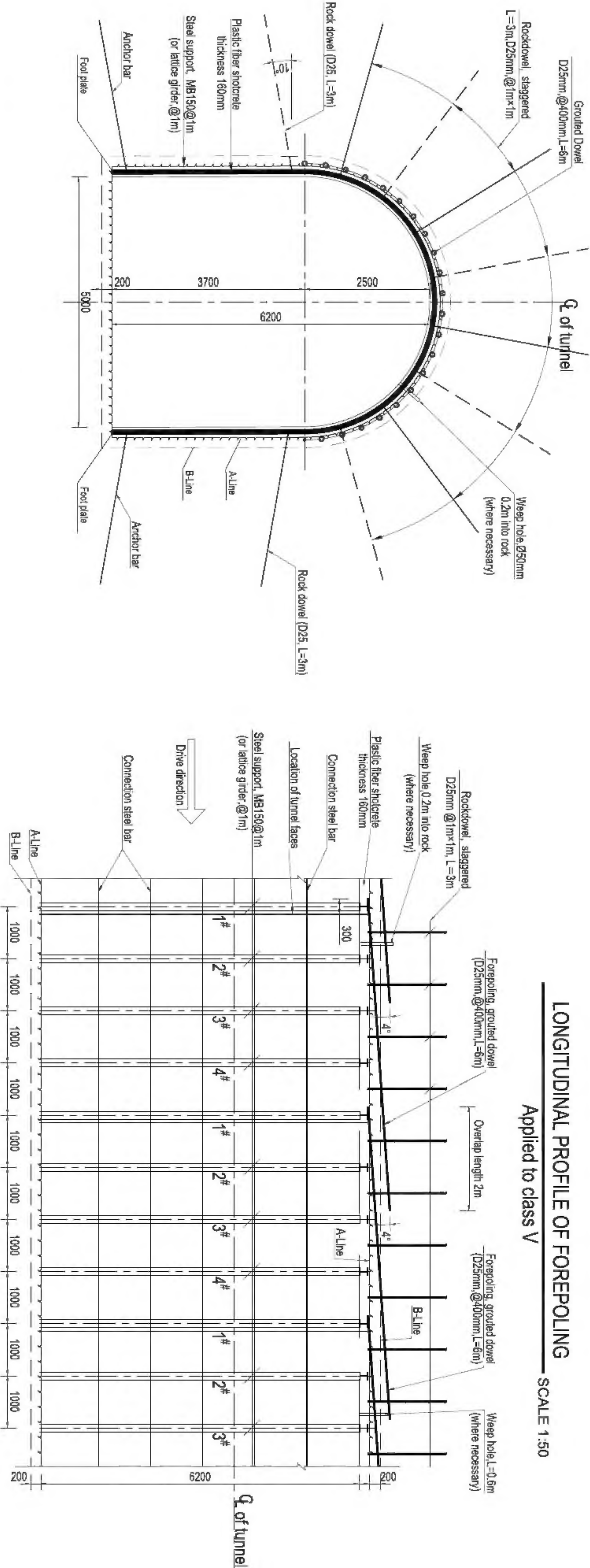
SCALE 1:100



LONGITUDINAL PROFILE OF FOREPOLING

SCALE 1:50

Applied to class V



NOTE

1. This set of drawings are the excavation and initial support of adit No.3.
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
3. The canopy forepoling is mainly used in the tunnel section with poor surrounding rock geology, which should be used together with dowel and steel support (or lattice girder), and the spacing of dowel should be consistent with that of steel support.
4. The steel support (or lattice girder) to rock class IV is subjected to the exposed geological condition.
5. The excavation profile may need to be adjusted to a "saw-tooth profile" and size of ribs/girders may also be adjusted.
6. Other notes see sheet 1 & sheet 2.

REFERENCE DRAWINGS

UT-C-150-CV-C-43004	Sampling Rock Stability Evaluation of Adit No.3
UT-C-100-CV-C-43004-01-05	Initial Design Drawing of Excavation and Support to Subsequent Construction
UT-C-06-CV-C-43004-02-05	Layout Drawing of Reinforcing for Adit No.3
UT-C-150-CV-C-43004	Drawing of excavation adit No.3 planing

SYMBOL AND LEGEND

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E	21 JUN 2022	FOR APPROVAL	DONG Z.Z.	LI Y.G.	HEO J.B.
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A	25 MAR 2021	FOR APPROVAL	DONG Z.Z.	LI Y.G.	HEO J.B.

PROJECT TITLE  
Upper Trishuli-1 HEP (216MW)



OWNER'S ENGINEER



CONTRACTOR

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DRAWING TITLE  
EXCAVATION AND INITIAL SUPPORT DRAWINGS  
OF ADIT NO.3 (4/5)

NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-150-CV-L-DG-43004	4 OF 5	F



1. This set of drawings are the excavation and initial support of adit No.3.  
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.  
3. Other notes see sheet 1 & sheet 2.

REFERENCE DRAWINGS

UT1-C-150-CV-L-DG-43002

Sampling Rock Stability Evaluation of Adit No.3

UT1-C-100-CV-L-DG-43001-01-05

Initial Design Drawing of Excavation and Support for Underground Adit

UT1-C-045-CV-L-DG-43005

Layout Drawing of Reinforcing for Adit No.3

UT1-C-150-CV-L-DG-43003

Detailing of Excavation and Rock Support

SYMBOL AND LEGEND

SCALE:

1:100

0

1

2

3

4

5m

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Han J.B.

E

21 JAN 2022

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DONE Z.Z.

Li Y.G.

Han J.B.

D

10 DEC 2021

FOR APPROVAL

DONE Z.Z.

Li Y.G.

Han J.B.

C

10 SEP 2021

FOR APPROVAL

DONE Z.Z.

Li Y.G.

Han J.B.

B

25 JUL 2021

FOR APPROVAL

DONE Z.Z.

Li Y.G.

Han J.B.

A

25 MAR 2021

FOR APPROVAL

DONE Z.Z.

Li Y.G.

Han J.B.

PROJECT TITLE

Upper Trishuli-1 HEP (216MW)

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NWEDC

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DRAWING TITLE

EXCAVATION AND INITIAL SUPPORT DRAWINGS OF ADIT NO.3 (S/S)

NO.

DRAWING NUMBER

SHEET NO.

REV. NO.

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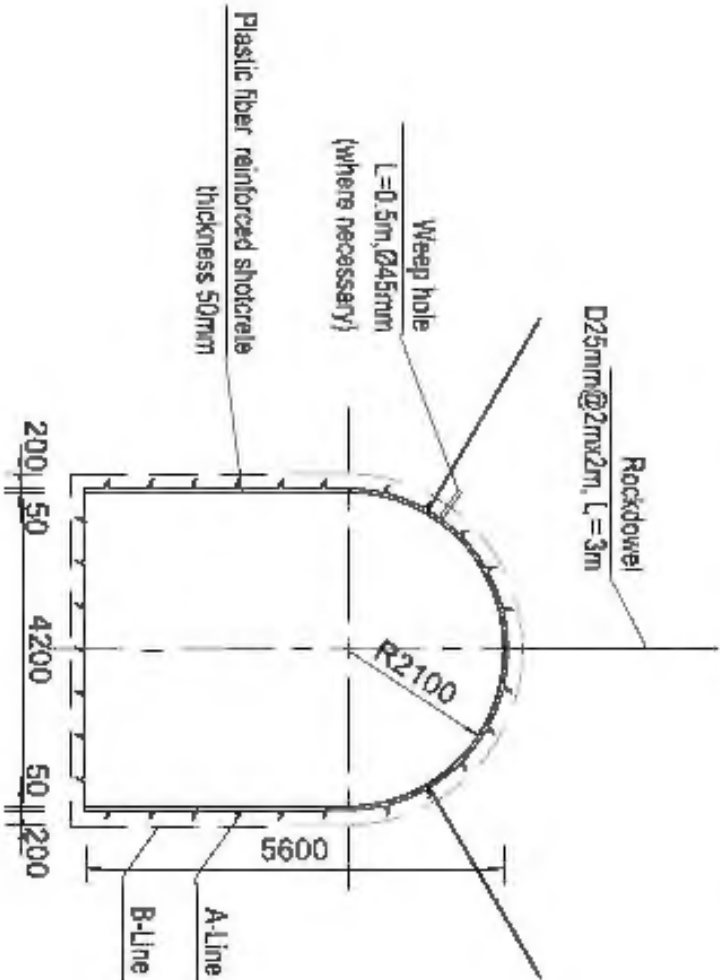
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5 OF 5

F

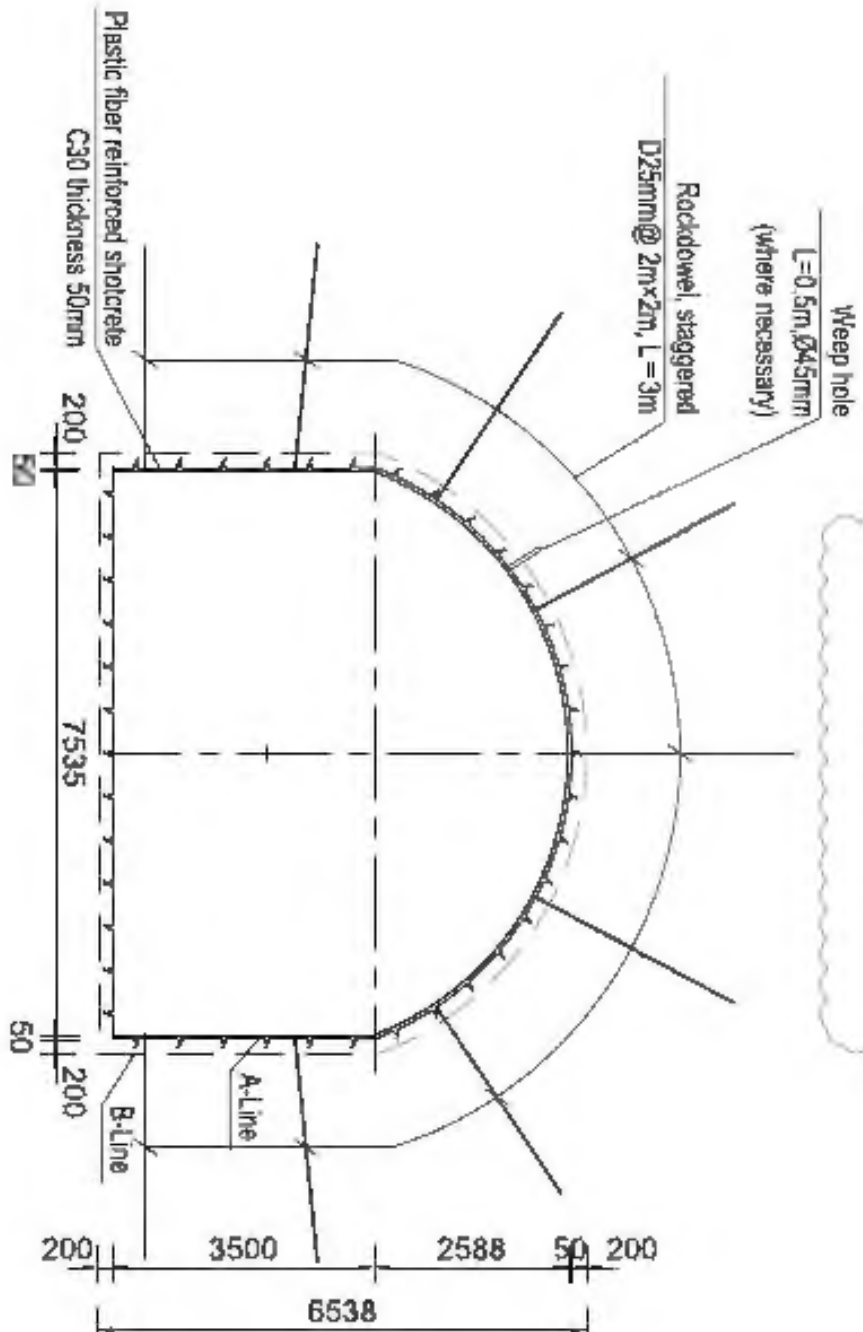
SECTION 1-1

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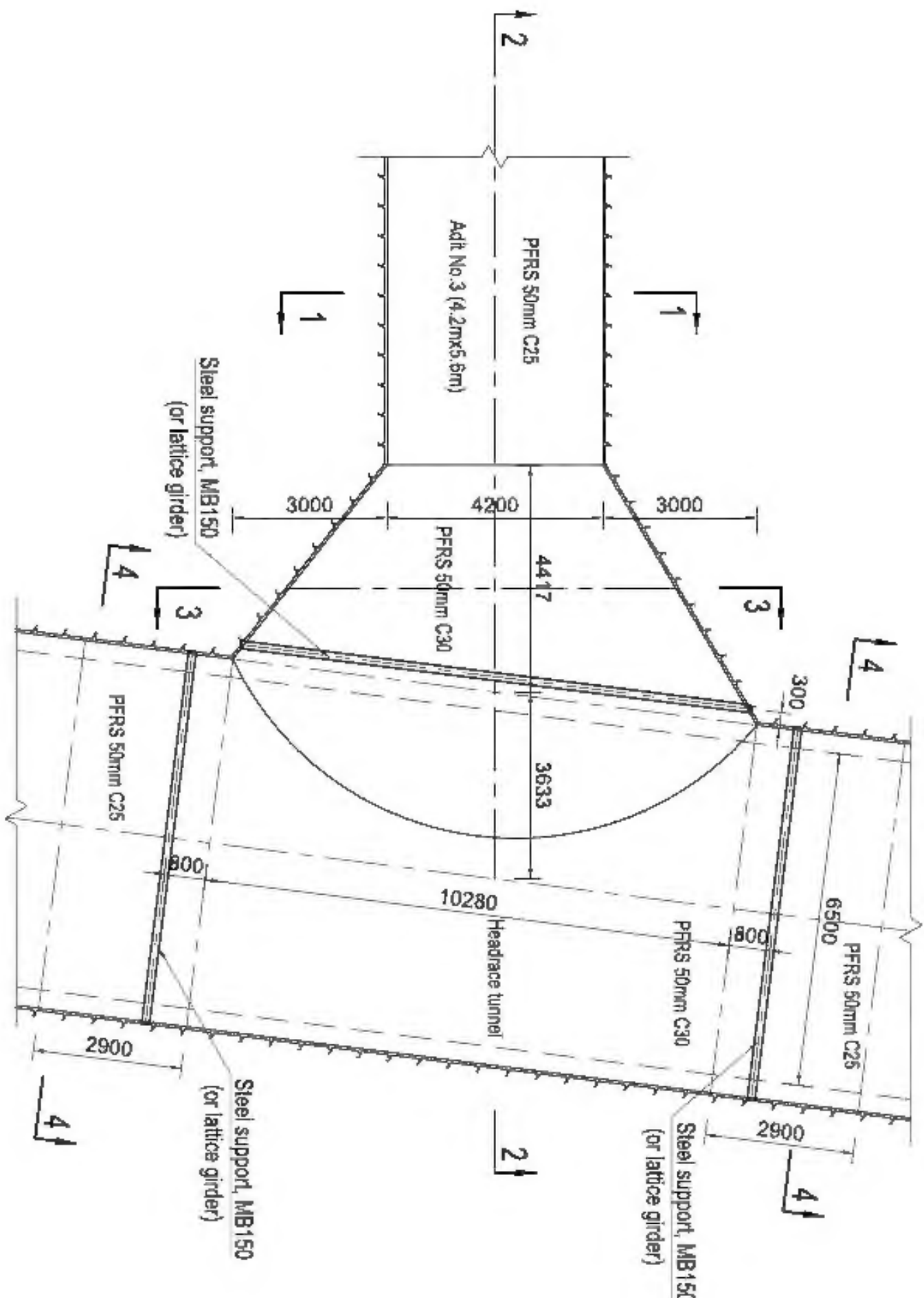
SECTION 3-3

SCALE 1:100



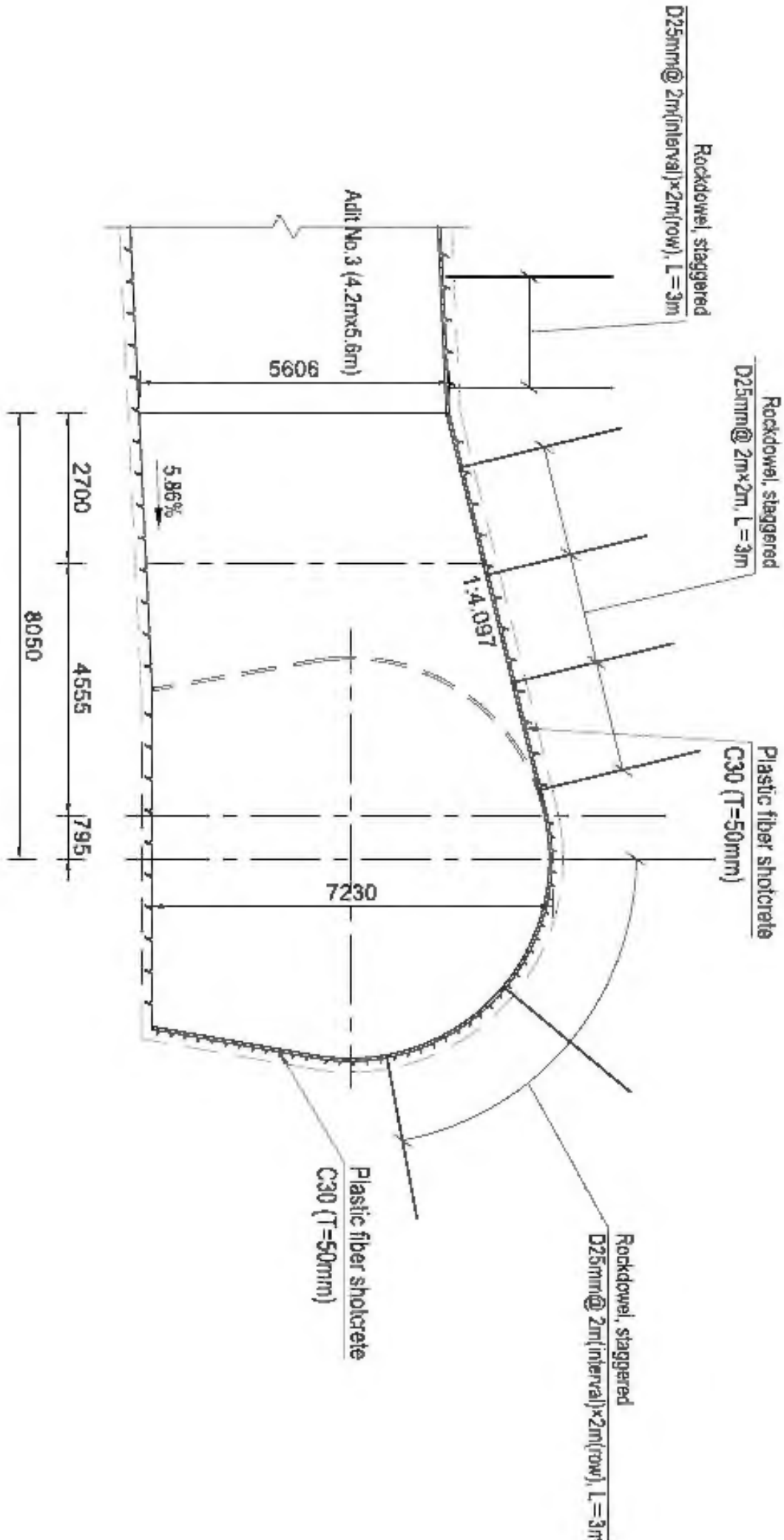
SECTION 2-2

SCALE 1:100



PLAN OF JUNCTION (ROCK CLASS II)

SCALE 1:100



SECTION 4-4

SCALE 1:100

